

Study Contracts Signed For S-IVB Experiment

NASA last week signed contracts with three aerospace firms for definition studies of a proposed experiment using a spent Saturn S-IVB stage and an experiment support module to permit manned space missions of up to 30 days.

Under terms of the three 60-day \$50,000 fixed price contracts, Douglas, McDonnell and Grumman will perform definition and preliminary design and evaluate a plan to make a spent stage hydrogen tank habitable for long-duration missions.

A unit to provide an interconnecting airlock between the Apollo Command and Service Modules and the launch vehicle's spent stage would be required. Also required will be environmental, electrical power, and life support provisions for the hydrogen tank and the experiment support module. The support module also will supply expendables to the CSM for that portion of the long-duration mission that is beyond its original capabilities. The unit will be the S-IVB Spent-Stage Experiment Support Module (SSESM). Existing flight hardware and subsystems available in the

manned space flight program would be used for the support module.

One end of the SSESM will be fitted with a docking assembly identical to that used in the LEM to permit docking with the CSM. The other end of the SSESM will be fitted with a suitable assembly which will permit attachment to the top of the S-IVB hydrogen tank. A hatch in the SSESM will permit egress into free space without depressurization of the tank or the CSM. Oxygen for the S-IVB pressurization and crew breathing will be stored in modules mounted external to the airlock. Once in orbit, the Apollo CSM will be separated and docked with the SSESM. The crew may then proceed to prepare the S-IVB, activate the SSESM systems, connect the SSESM to the S-IVB tank, and set up the tank for habitation.

The spent-stage experiment plans are being managed by Marshall Space Flight Center. MSC has technical and contractual responsibility for the SSESM portion of the overall experiment studies.

Cape Testing Continues On Gemini IX, A/S 202

Pre-launch preparations at Kennedy Space Center for Gemini IX May 17 and for

IESD Program Set For Second 'Family Night'

The second MSC technical symposium tailored for the entire family will be held May 9 in the Auditorium starting at 8 pm. The Instrumentation and Electronics Systems Division will present the Symposium program.

First presentation will be "Space Communications" by David M. Hickman in which spacecraft application and communications unique to space flight will be discussed.

Max Engert's topic will be "Apollo Spacecraft Television," and will include a description of Apollo hardware and demonstrations of bandwidth compressed television systems.

"Audio Systems Development" will be Michael K. Hendrix' topic and will cover current IESD work in audio systems with bandwidth-limited speech transmission, and an example of voice quality received from a Gemini mission.

How radar works and a discussion of Gemini rendezvous radar will be Richard G. Fenner's presentation and will include Gemini rendezvous films.

Woodie L. Thompson will speak on "Laser Communications" and will demonstrate the MSC-4 Optical Communications Experiment.

Apollo/Saturn 202 later this year are proceeding on schedule.

Flight seats were installed Monday in the Gemini IX spacecraft in preparation for hypergolic servicing and cabin pyrotechnic buildup which was expected to begin Wednesday. Beneath the White Room floor, the Gemini Launch Vehicle was undergoing clean-up following a successful tanking test.

Spacecraft/GLV joint combined systems tests were conducted April 19, and the electrical interference and interface tests were completed the previous week.

Hangar checkout of Agena 5004, rendezvous vehicle for the Gemini IX mission, was being completed this week, and the Atlas Standard Launch Vehicle underwent late this week a test preparatory to Atlas/Agena mating next week.

Apollo/Saturn 202 activities this week at Kennedy Space Center included moving Service Module 011 to the Cryogenic Facility from Launch Complex 16 where it had been in leakage testing. Command Module 011 was leak tested in the Manned Spacecraft Operations Building at KSC during the same period.

CM-011 arrived at KSC April 16 and SM-011 arrived the previous week.

In other Apollo-related testing, a three-cell configuration Apollo fuel cell was run at White Sands Test Facility for full mission duration, including service propulsion requirement profiles.

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Gemini IX Launch Scheduled No Earlier Than May 17

The Gemini IX spacecraft and its companion Agena target vehicle will be launched from Cape Kennedy no earlier than May 17 on a three-day flight to explore new rendezvous techniques and conduct extravehicular activity.

Liftoff time for the Agena is 9:00 a.m. CST, and the Gemini liftoff is scheduled at 10:39:08 CST. An Atlas booster, generating 390,000 pounds of thrust, will launch the Gemini Agena Target Vehicle. Gemini IX will be put into orbit by the two-stage Titan II Gemini Launch Vehicle, with a lift-off thrust of 430,000 pounds. Second stage thrust is 100,000 pounds.

The Agena target will be inserted into a 161 nm circular orbit. Gemini IX will be inserted into a 87 nm by 146 nm elliptical orbit. Initial rendezvous of the two spacecraft is scheduled in the third revolution, approximately four hours after Gemini liftoff.

Command pilot for the mission, Thomas P. Stafford, was pilot on the Gemini VI mission which accomplished the first rendezvous in space with the Gemini VII spacecraft on December 15, 1965. Eugene A. Cernan is pilot for Gemini IX. James A. Lovell is back-up command pilot and Edwin E. Aldrin is back-up pilot.

Approximately 30 minutes after rendezvous, Gemini IX will dock with the Agena over Hawaii. A bending test with the Agena and a redocking by the pilot will be performed before the crew powers down the spacecraft for an eight-hour rest period.

The extravehicular activity by pilot Cernan will begin near the end of the thirteenth revolution and continue for one and one half revolutions. Hatch opening will occur at about 20 hours, 50 minutes into the mission. Cernan will reenter the spacecraft approximately 2 hours and 25 minutes later.

In the first daylight portion of EVA, Cernan will remain on a 25-foot umbilical tether, with oxygen supplied from the spacecraft. He will retrieve a meteorite collection experiment from the Gemini adapter and expose some new surfaces on a meteorite collection experiment on the Agena. He will evaluate tether dynamics of the 25-foot umbilical and evaluate the handrail and handholds on the adapter section.

During the night pass, he will be in the adapter section and don the Astronaut Maneuvering Unit, a backpack with a self-



SPACEWALK REHEARSAL—Gemini IX pilot Eugene A. Cernan practices extravehicular procedures with an AMU (Astronaut Maneuvering Unit) in the aerospace flight simulator at LTV Aerospace Corporation's Dallas plant. LTV Aerospace builds the AMU for the US Air Force Space Systems Division as part of Experiment D-12, scheduled for Gemini IX and XII.

contained propulsion unit and oxygen supply.

At the next sunrise, Stafford will undock the Gemini from the Agena and move 120 feet out of plane from the Agena. The EVA pilot, moving to the front the spacecraft, will evaluate attitude control and translation characteristics of the maneuvering unit. Working on a 125-foot-long tether, he will translate to the undocked Agena, and then reenter the spacecraft.

After EVA and redocking, the remainder of the flight will include three burns of the Agena primary propulsion system while docked with Gemini, two rendezvous of Gemini with the Agena and a burn of the Agena secondary propulsion system while docked with Gemini.

Seven experiments will be carried out on the mission.

Schirra Gets Doctorate

Lafayette College in Easton, Pa. April 15 awarded Gemini IX command pilot Walter M. Schirra an honorary Doctor of Aeronautical Engineering degree during a convocation commemorating 100 years of science and engineering instruction on the campus.

Scientific experiments include zodiacal light photography, meteorite collection experiments both on Gemini and Agena, and airglow horizon photography. Technological experiments are UHF/VHF polarization and the astronaut maneuvering unit. The medical experiment is the bioassays of body fluids.

Objectives of the Gemini IX mission are rendezvous and docking with the Agena target vehicle and extravehicular activity by the pilot. In addition, the mission will include maneuvers of the docked vehicles using the Agena propulsion systems, separation and docking practices, Gemini re-rendezvous from above the Agena (simulating lunar excursion module rendezvous), guidance of the spacecraft to a pre-selected landing area and maneuvering of the Agena into a parking orbit for use as a target on a later Gemini mission.

Landing of the spacecraft is scheduled in the West Atlantic Recovery Zone about 345 statute miles east of Cape Kennedy at the beginning of the forty-fifth revolution after approximately 70 hours, 40 minutes of flight.

Apollo Milestone



ROLL-OUT REPORT—Principals in roll-out ceremonies for the Apollo/Saturn 204 service module at North American Aviation's Tulsa plant April 1 field reporters' questions at a post-rollout press conference. The service module airframe was shipped to the NAA-Downey plant for installation of systems. Left to right are Owen Maynard, Chief ASPO Systems Engineering Division, Richard F. Walker, vice president and manager NAA-Tulsa, Dr. Robert C. Seamans, Jr., NASA Deputy Administrator, and Tom E. Cole, Apollo project manager, NAA-Tulsa. Apollo/Saturn 204 possibly will be the first manned Apollo mission.

Langley Negotiates With Martin To Study Lifting-Body Programs

The Martin Co., Baltimore, Md., has been selected by NASA to make a study of the costs, crew size and complexity of a flight research program using a manned lifting-body vehicle.

The study contract will be negotiated with Martin by the NASA Langley Research Center, Hampton, Va. The con-

tract is expected to cost about \$450,000.

Wingless lifting bodies which rely on their shape alone to provide aerodynamic lift for flight in the Earth's atmosphere, are being studied by NASA's Office of Advanced Research and Technology for possible use in a variety of future manned space missions. Their added lift and

maneuverability provide a number of advantages over current space vehicles.

In conducting the study, the contractor is required to consider an HL-10 lifting-body concept capable of carrying one, two, four, six, or eight crew members. The HL-10 is considered representative of advanced lifting entry vehicles.

NASA has specified Titan II, Titan III and Saturn IB as potential launch vehicles. For the study purposes, the Rogers Dry Lake at Edwards, Calif., home of NASA's Flight Research Center, would be a probable landing site.

Although NASA's approved flight programs do not include such an effort, the research must be performed well in advance to permit freedom of choice if such a program becomes needed.

Thus far, all U.S. manned spacecraft have been landed in the oceans, but future mission planners will need the option of landing at other locations such as large, dry lake beds, and will want a spacecraft able to fly long distances inside the atmosphere before maneuvering to a safe touchdown under a pilot's control.

Lifting body vehicles are considered potentially useful for a variety of future missions in space; for example, spacecraft inspection, repair and reconnaissance; logistic and resupply of advanced space stations; search and rescue; manned interplanetary missions, and as an upper stage of a recoverable launch vehicle.

The HL-10 concept was evolved through extensive research at Langley. The letters "HL" stand for Horizontal Landing, while the numeral 10 indicates the place in a series of research models.

NASA, Sweden Sign Pact For Joint Upper Air Research

Pulsed laser radar will be used for upper atmosphere investigations under an agreement between the Swedish Space Research Committee (SSRC) and NASA.

The principal scientific objective of the experiments will be to determine the height, distribution and scattering properties of cosmic dust and aerosol particles during the presence and absence of noctilucent clouds (faintly luminous clouds which can be seen at heights of 75 to 90 kilometers at high latitudes at dusk or sunrise).

The observation of noctilucent clouds is restricted to occasions when these clouds are illuminated by the Sun but lower levels of the atmosphere are still in the Earth's shadow. The time for such observations is very short, but can be extended if a suitable artificial light source is used. The pulsed ruby laser, as an extremely high energy light source concentrated into a narrow spectral line and confined to a very small solid angle, has been selected for this purpose.

The laser radar operates on the same principle as ordinary radar, but uses light instead of radio waves. The laser is beamed

at the atmospheric layer under study. The particles floating in that layer scatter the luminous energy back to the ground.

The returns are detected by a photomultiplier receiving unit and fed into a memory unit where they are analyzed automatically. In this memory unit, return pulses corresponding to heights of 79 to 80 kilometers are stored in one channel, 80 to 81 kilometers in another channel, and so on.

Stored information is displayed either on an oscilloscope and photographed, or punched on tape for further evaluation. The results permit correlation of the height and density of aerosol particles with the presence and absence of noctilucent clouds.

Cape Testing

(Continued from page 1)

The tests also included placing the cells on line for 48 hours and operation with extranormal loads.

Upon completion of the WSTF series of fuel cell tests, the cells and associated ground support equipment were shipped to MSC where they are scheduled for additional testing in the Thermochemical Test Chamber beginning about June 1.

Flight Control Teams For Gemini IX Named

Flight Controller assignments for the Gemini IX mission in the Mission Control Center and at tracking stations in the Manned Space Flight Network have been announced by the Flight Control Division.

Three shifts of flight controllers will man consoles in the third-floor Mission Operations Control Room (MOCR) during the mission. The first shift will be led by White Team Flight Director Eugene F. Kranz; second shift by Black Team Flight Director Glynn S. Lunney, and third shift by Green Team Flight Director Clifford E. Charlesworth.

Other MOCR console positions follow, listed as first shift-1, second shift-2, and third shift-3:

Assistant Flight Director: 1. Jones W. Roach and Edward I. Fendell; 2. Donald R. Butler; 3. William E. Platt and Lawrence S. Canin.

Operations and Procedures Officer: 1. William Molnar and Henry B. Fisher; 2. James R. Bates; 3. Richard H. Sutton.

Flight Surgeon: 1. Dr. Charles A. Berry; 2. Dr. D. Owen Coons; 3. Dr. A. D. Catterson.

Spacecraft Communicator: 1. Neil A. Armstrong; 2. Richard F. Gordon; 3. L. Gordon Cooper.

Booster Systems Engineer (first shift only) William E. Platt.

Tank Monitor (first shift only) L. Gordon Cooper.

Guidance, Navigation and Control Engineer: 1. Gerald D. Griffin; 2. Arnold D. Aldrich; 3. Gary E. Coen.

Electrical, Environmental and Communications Engineer (EECOM): 1. John W. Aaron; 2. Walter M. Merritt; 3. Thomas R. Loe.

Agema: 1. Melvin F. Brooks; 2. James E. Saultz, Sr.; 3. Bruce H. Walton.

Agema Systems: 1. Robert L. Carlton; 2. Harold A. Loden; 3. Harry Smith.

Flight Dynamics: 1. Edward L. Pavelka; 2. Stewart L. Davis; 3. Jerry C. Bostic.

Retrofire Officer: 1. David B. Massaro; 2. Thomas F. Carter; 3. John S. Llewellyn.

Guidance Officer: 1. William E. Fenner and Stephen G. Bales; 2. Kenneth W. Russell; 3. Charles B. Parker.

Network Controller: 1. Capt. A. A. Piske and Capt. George Ojalehto; 2. Lloyd White and Lawrence Lonero; 3. George T. Jenkins and Richard G. Ayers.

Public Affairs Officer: 1. Al Chop; 2. Jack Riley; 3. Terry White.

Tracking station flight controller assignments are as follows:

Canary Islands: Harold M. Draughon, command communicator; John E. Walsh and Richard A. Gardner, Gemini systems; Williard D. Robinson and Jack Knight, Jr., Agema systems; Maj. Charles L. Wilson, aeromed.

Carnarvon: William D. Garvin and Franklin W. Brizzolara, command communicator; Albert W. Barker and Frank Digenova, Gemini systems; Hershel R. Perkins and Donald R. Puddy, Agema systems; Wing Cdr. L. M. Walsh, MC/Royal Australian Air Force, aeromed.

Hawaii: Gary B. Scott and Lawrence I. D. Armstrong, command communicator; Floyd E. Claunch and Myles E. Franklin, Gemini systems; George P. Contois and Thomas E. Weichel, Agema systems; Maj. Paul Nugent and Capt. Russell R. Conley, aeromed.

Guaymas: William F. Buchholz, command communicator; Robert F. Grasmeyer and George W. Conway, Gemini systems; David R. Huckaby and Charles L. Gruby, Agema systems; Cdr. Channing L. Ewing and LtCdr Richard Millington MC/USN, aeromed.

USS *Coastal Sentry*: Arda J. Roy, command communicator; Joseph Fuller, Jr. and Eugene W. Burrill, Gemini systems; Robert D. Legler and Larry W. Strimple, Agema systems; Capt. Lawrence J. Enders, aeromed.

USS *Rose Knot*: Keith K. Kundel and William G. Bastedo, command communicator; Gene F. Muse and Richard F. Polman-ter, Gemini systems; Luis J. Espinoza, Agema systems; Capt. James F. Wittmer, aeromed.

Safety Training Planned in June For Supervisors

A supervisory safety course has been scheduled June 13-24 by the MSC Safety Office for MSC and contractor supervisors.

Allan "Ike" Martin, Regional consultant with the US Department of Labor Bureau of Labor Standards at New Orleans, will conduct the course at Ellington AFB. Martin formerly was a safety engineer with E. I. duPont de Nemours and Todd Shipyards prior to joining the Labor Department in 1959. Martin conducted safety course at MSC in late 1965.

The new safety course is aimed toward assisting supervisors to better carry out safety functions within their responsibilities. The Personnel Division Training Branch is coordinating the course program.

Tentative plans call for the course to be divided into four ten-hour classes. Topics covered in each class include: supervisory responsibility for safety, accident causes, determining injury rates, fire protection and prevention, accident investigation, motor vehicle safety and the "what and why" of President Johnson's "Mission Safety 70" program.



MARTIN

NATURE'S HIGH VOLTAGE—

Good Shelter Choice Avoids Lightning's Untamed Charge

(Part of a continuing series on driving, home and job safety by the MSC Safety Office.)

Everyone has experienced the tingle of electrical shock when scooting across the plastic seat covers in a car or when touching something after walking across a woolen carpet. These are mild electrostatic discharges which tend to scare more than harm. It is the same basic electricity used every day at home to run appliances or at work to run machines. Electricity, like all good servants, has some bad attributes. These attributes manifest themselves in several ways, usually all spectacular.

The Granddaddy of all electrical discharges is the lightning strike. Lightning is the discharge of electrical energy from one potential to another, either from cloud-to-cloud, cloud-to-earth or sometimes earth-to-cloud. Just as the spark from a finger can be measured at several thousand volts, a lightning strike is proportionately larger, sometimes measuring up to the hundreds of millions of volts and tens of thousands of amperes.

In this part of the country where the wind blows and rains are usually the order of the day, static electricity is being constantly generated and provides a tremendous potential for lightning strikes. Whether at home, at work or recreation people are susceptible to lightning strikes.

Some places to avoid when thunderstorms are anticipated are lone buildings on hills, the roof of any building, lone trees, towers or other objects that are higher than the surrounding area. Since water is generally conductive, bodies of water are extremely susceptible to lightning strikes. When in a boat or out scuba diving, the best thing to do is to head for shore. A boat can easily be the tallest object around, and the most likely path of an electrical discharge.

Week-end pilots should avoid thunderstorms. The turbulence around a thunder storm should be enough to discourage most pilots, but there is also the possibility that a metal airplane can trigger a lightning strike either from one cloud to another, or from a cloud to the ground. Seldom are either the passengers or pilot injured by a lightning strike, but usually the plane receives some damage.

The golf course can be just as dangerous a place as either flying or boating, especially the isolated shelters or trees that dot many courses during a squall. Since these objects are usually the tallest object around, they offer the easiest path to the ground for an electrical discharge and are the most susceptible to a lightning strike.

Is any place safe from lightning? Some places are safer than others. A car is one of the safest in that one is completely surrounded by metal and is relatively well grounded. Other places that are safe is inside large metal or metal-frame build-

ings, the center of a downstairs room, in a cave or at the base of a cliff, a grove of trees of uniform height offers some protection. The best place, of course, is inside a building with lightning protection such as at MSC.

Some things one should always avoid during a thunderstorm are electrical equipment or appliances, water or sewer pipes, fireplaces, TV antennas, fences and pipe lines. The possibility of being struck by lightning is better than one in a million. Only 165 people have lost their lives due to lightning strikes since 1963. Avoiding hazardous places lessens the danger of being struck by lightning.

Cortright Briefs AIAA Section on Space Sciences

"Where Do We Stand in Space Sciences and Applications?" will be the topic of Edgar M. Cortright, Deputy Associate Administrator of the NASA Office of Space Science and Applications, Monday night when he addresses the Houston Section of the AIAA.



Cortright's talk will summarize the progress made in the areas of physics and astronomy, lunar and planetary exploration, biosciences, meteorology, communications and manned space sciences during recent years. Future opportunities in these areas will be outlined and the relationship of the unmanned to the manned program will be discussed briefly.

The meeting will be at the Holiday Inn on NASA Road 1. Cocktails will be at 6 pm, dinner at 7 pm and the program at 8 pm. Section members are invited to bring guests. Reservations at \$4 a person can be made with Gail Renick at HU 8-0080, Ext 61, or with Gail Love at HU 8-1400.

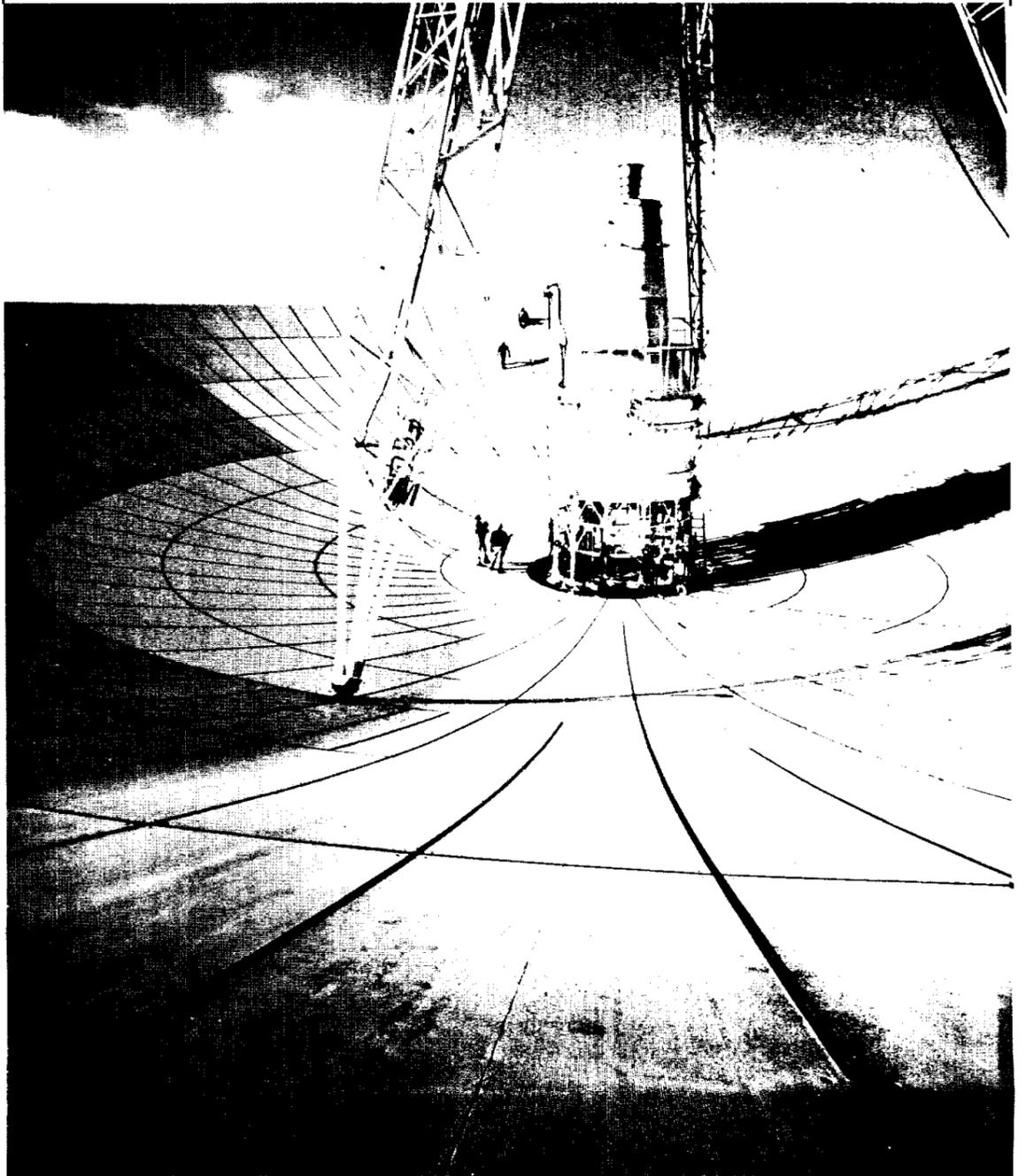
Tech Library Opens Up Shop In New Quarters

The MSC Technical Library Monday will open for business in its new quarters in Building 45, just west of the Mission Control Center.

Reading room, reference and circulation services were suspended last Monday to allow packing of books and stack materials to removal to the new one-story Library wing of the seven-story office building.

The move, announced for an earlier date by the *Roundup*, was rescheduled for the week of April 25.

Dish for Paul Bunyan's Hound Dawg?



DEEP-SPACE EAR—Workmen are dwarfed by the 210-foot diameter reflector dish of the NASA Deep Space Network tracking and communications antenna at Goldstone, Calif. The structure in the center is the Cassegrainian feed cone which receives signals focused upon it by the subreflector at the top of the tripod legs. The primary reflector is surfaced with thin sheets of aluminum. Scheduled to be operational in June, the new antenna is powerful enough to communicate with a spacecraft at the edge of the solar system.

PLUTO, DO YOU READ ME?—

Goldstone's 210-ft. Dish Antenna Dedicated in Ceremonies Today

A 210-ft tracking and telemetry antenna—the largest in the United States deep space network—was officially dedicated today at Goldstone, Cal.

The newest addition to U.S. tracking facilities, located in the Mojave Desert will be able to follow future spacecraft out to the planet Pluto at the edge of the solar system.

The antenna, created by NASA and the Jet Propulsion Laboratory for research in the

far reaches of the solar system, is one of the world's largest and most sensitive instruments. The diameter of its parabolic "dish" is 210 feet—an area of nearly an acre—and it stands as high as a 21-story building.

Although not the largest antenna in existence, the Goldstone "210" is the largest specifically designed for NASA's deep space projects. It is expected to be in operation this summer.

The 210-ft antenna must have the same speed and accuracy as an 85-ft "dish" in following a spacecraft from horizon to horizon. Until now the 85-ft dish has been the largest in the NASA networks.

Another requirement is stability to withstand winds up to 50 miles an hour, pounding rain, and the weight of snow.

The dedication ceremony was held 11 am, with participation by members of Congress, California State officials, NASA and the JPL, and U.S. and foreign scientists.

GE To Build Reentry Heat Research Craft

NASA has selected the General Electric Co., Missiles and Space Division, Philadelphia, to build the spacecraft for a flight re-entry heating project to be launched on a Scout vehicle.

NASA's Langley Research Center, Hampton, Va., will negotiate an incentive type contract valued at approximately \$3 million with GE. The contractor will build one 13-foot conical flight spacecraft plus a prototype and one backup.

The experiment will be the sixth in a series of Scout-launched re-entry heating flights which form an important part of an overall program sponsored by NASA's Office of Advanced Research and Technology (OART) to complement extensive experimentation in government and industrial laboratories with selected flight projects.

AFGE Lodge Meets

The American Federation of Government Employees, Lodge 2284, will hold its regular monthly meeting May 9 at the Webster State Bank beginning at 5 p.m. Members are urged to attend, prospective members and interested persons are invited.

President J. H. O'Neill will report on the caucus held in Dallas and the main speaker for the evening will be Mr. Glenn Petterson, national representative for the Tenth District.

A/S 202 Command Module Shipped To Cape Kennedy

Two Apollo spacecraft vehicles—one scheduled to be the second unmanned Apollo to be launched into space—have been delivered to NASA.

The vehicles are identified as Spacecraft 011 and 007. They were produced by North American Aviation's Space and Information Systems Division for MSC.

Spacecraft 007 was delivered to Houston where it will be used for water impact and floatation tests in the Gulf of Mexico and in an environmental tank at MSC. These will be the final Apollo water landing tests prior to manned earth orbital flights.

Spacecraft 007 contains all recovery systems and equipment other than those required during actual flight. The total configuration is that of a flight-type command module.

Spacecraft 011, which contains a command module similar to those in which astronauts will ride in later flights, will be prepared for launch during the third quarter of this year aboard a two-stage Saturn IB vehicle. The Spacecraft 011 service module contains support systems including environmental control and fuel cell systems and the main spacecraft propulsion system.

Primary goal of Spacecraft 011's mission will be to gather additional data on the Apollo heat shield to supplement that obtained in the A/S 201 mission with Spacecraft 009, the first flight-type Apollo launched into space.

Spacecraft 009 was the largest payload—about 9,500 pounds—yet brought back from space by the United States, and had the highest re-entry velocity—approximately 26,500 feet per second, or about 18,000 miles

an hour—attained by any large U.S. spacecraft.

Spacecraft 011's re-entry into the atmosphere will be on an elongated trajectory to produce a higher, total heat load. It also will establish a number of firsts. Among them will be the initial use in space of two important Apollo subsystems, the Pratt & Whitney fuel cell system which will provide electrical power and drinkable water for the lunar astronauts, and the MIT guidance and navigation system which will guide the spacecraft to and from the moon.

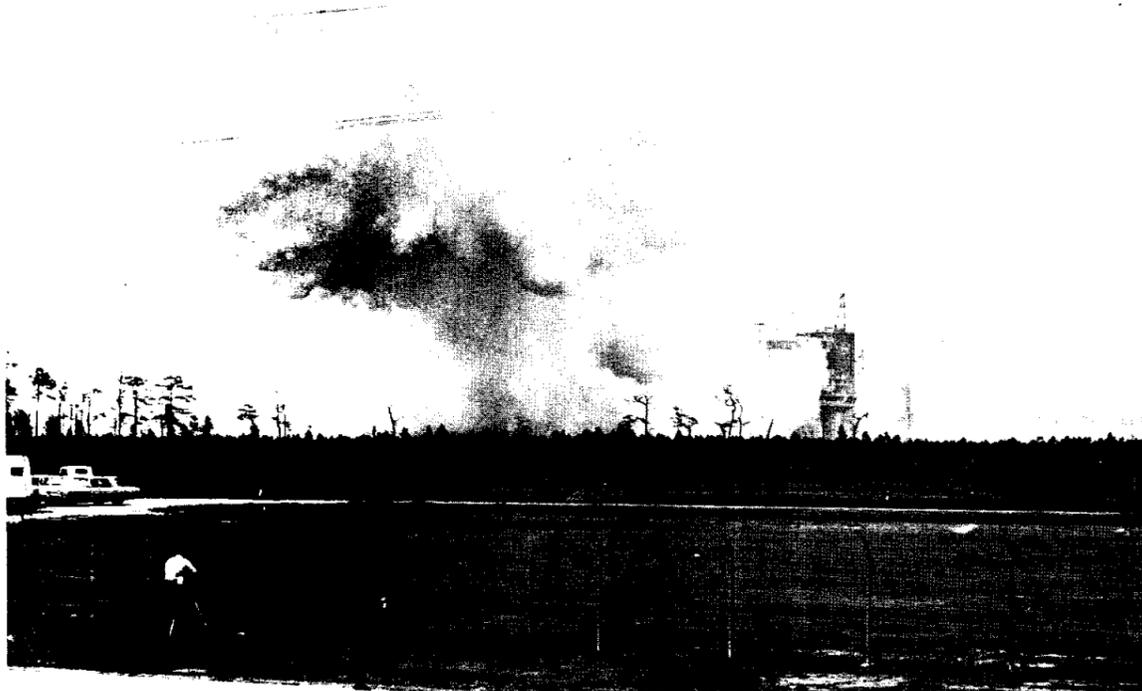
Spacecraft 011's mission will take approximately 1½ hours and will be the longest in both time and distance to date for an Apollo. The planned 18,000 mile flight will take the spacecraft from its Cape Kennedy launch pad on the Atlantic coast, over Africa, past Australia, and to a splashdown approximately 250 miles east-southeast of Wake Island in the Pacific Ocean.

The spacecraft will reach a peak altitude of approximately 750 miles during the flight.

Pearland-Friendswood Jaycees Organized

MSC men ages 21-35 who are interested in learning leadership through community development are invited to join the newly-organized Pearland-Friendswood Chapter of the Junior Chamber of Commerce.

Bob Bristow, Internal Vice President of the new Chapter, has details on membership and meetings. His extension is 2775; home HU 5-2219.



WHERE THERE'S SMOKE—Five J-2 liquid oxygen/liquid hydrogen engines spew smoke and flame during a static test of a Saturn V S-II stage at the NASA Mississippi Test Facility. The 15-second duration firing was the first firing at the new facility.

Saturn S-II Stage Static Fired In First Test At Mississippi Site

A captive rocket test was conducted last Friday at the NASA Mississippi Test Facility, marking the first operational use of NASA's newest installation.

The static test was of the S-II-T, an all-systems test version of the second stage of the Apollo/Saturn V space vehicle and largest and most powerful liquid hydrogen rocket.

Although the one-million pound thrust S-II rocket was fired for only a few seconds, it demonstrated the readiness of the \$300 million rocket proving ground to assume its role in this nation's space exploration programs.

The first "hot" test came less than three years after the first tree was cut signaling the start of construction May 17, 1963. NASA announced that it would develop MTF, as it is now called, October 25, 1961, as a "vital link in this nation's manned lunar landing program."

The development of this unique national rocket testing site has involved as many as 250 contractors and as many as 6,000 construction and operational personnel on the South Mississippi base during the peak of its construction.

A major mission of the Mississippi facility is to static test production models of the S-II second stage and the seven and one-half million pound thrust S-IC first stage of the Saturn V.

An added mission of the new facility is to perform developmental tests on the S-II-T to accumulate performance data to assist in design and development of later flight versions of the stage.

Extensive tests will now be conducted on the S-II-T building up to a full duration firing of over six minutes.

The S-II is being built for

NASA by North American Aviation, Inc., at facilities in Seal Beach, California and transported to MTF through the Panama Canal. It is being tested at MTF by North American.

The S-II rocket, designed and built to ignite in space, is 33 feet in diameter and 81½ feet long. It will be used to boost the three-man Apollo spacecraft from an altitude of about 40 miles to 100 miles after S-IC burnout.

The Mississippi facility is a government-owned contractor-operated facility located on 13,500 acres of land in Hancock County. It is surrounded by a 128,000-acre acoustic buffer zone in Hancock and Pearl River Counties in Mississippi and St. Tammany Parish in Louisiana. The site is 45 water miles from the NASA Michoud Assembly Facilities in New Orleans, Louisiana.

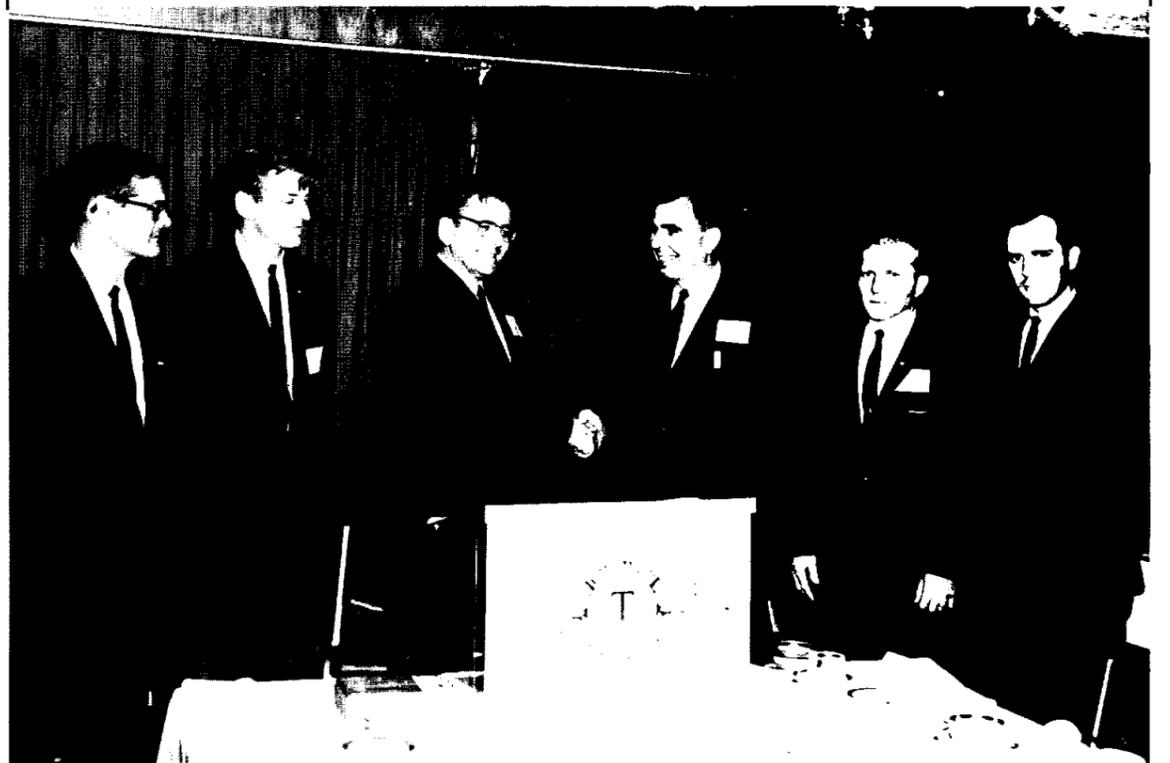
In addition to the 200-foot tall stand used in Friday's firing, two other static test towers are still under construction, a 400-foot tall dual stand to test fire the S-IC booster and a second S-II stand. Other major construction projects yet to be completed at the modern rocket testing site include a Vertical Checkout and Storage Facility and a Components Service Facility. There are some 60 buildings and structures on the site.

The facility is a part of the NASA George C. Marshall Space Flight Center in Huntsville, Alabama, directed by Dr. Wernher von Braun. It is an organizational element of the Marshall Center's Industrial Operations headed by Brig. Gen. Edmund O'Connor. Jackson M. Balch is Manager of the new rocket testing base.

When construction is completely finished in early 1967,

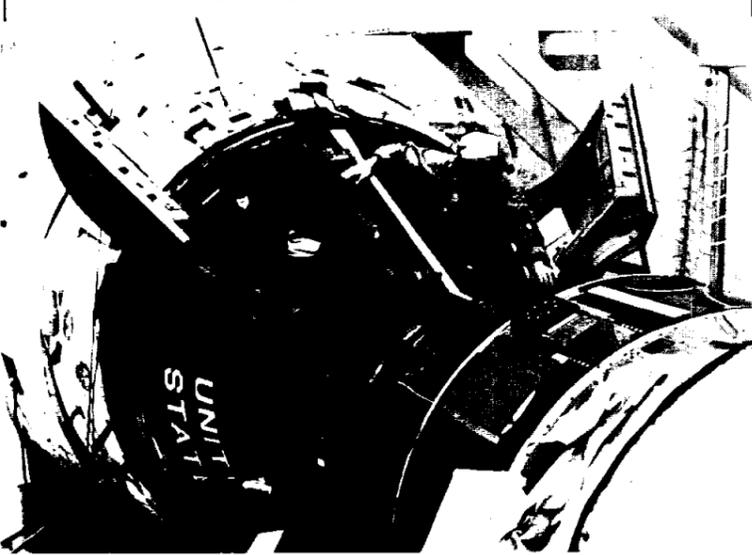
the base will employ about 3,000 persons. The government-industry team will include people from the following: NASA, which has overall management responsibility for the base; The Boeing Company, which will test its S-IC booster; North American Aviation, Inc., which will test its S-II stage; and the General Electric Company, which is NASA's prime contractor for the operation and maintenance of the base. The U. S. Army Corps of Engineers is responsible for land acquisition and construction.

MSC Toastmasters' Choice



GUEST SPEAKER—Dave Lang, MSC Chief of Procurement and Contracts Division, third from right, congratulates the newly elected MSC Toastmaster president Ernie Gillam. Lang was guest speaker at the Toastmasters' installation of officers and stressed the value of Toastmasters training to any individual. New officers were installed by John Agee, Governor of Area 10, District 56, Toastmasters International. MSC Toastmasters meet the first and third Wednesdays of each month at 6 pm at the Kings Inn. Others in the photo, left to right, are Bill Jones, Fred Burns, Gilliam, Lang, Dick Crane and Steve Whitson.

Rendezvous Rehearsal



GROUND WRINGOUT—Gemini IX backup pilot Edwin E. Aldrin and prime command pilot Thomas P. Stafford put the Gemini IX spacecraft and its Agena rendezvous vehicle through their paces during electrical interference and interface tests atop the "timber tower" at Kennedy Space Center.

EXCHANGE COUNCIL OBJECTIVES—

Employee Recreational Facility, Expanded Food Service Planned

Planning for an on-site recreational facility for MSC employees and the expansion of cafeteria service made possible by the second cafeteria now under construction are the major objectives of a four-point program for 1966 planned by the MSC Exchange Council. Also planned by the Council are a sales counter in the existing cafeteria for non-food items, and a continuing information program on Exchange Council activities.

The Exchange Council was organized for the purpose of establishing and operating activ-

ities have a direct bearing on the welfare and morale of MSC employees. Among these activities are operation of the cafeteria and providing vending machine services.

The Council operates the cafeteria directly, and Manager C. L. Spillers and all cafeteria employees are Exchange employees. Vending machine operations, on the other hand, are concessions let by the Exchange.

Exchange policy is to operate the cafeteria as near a break-even point as possible while funding employee activities from other sources, primarily vending machine revenues.

The second cafeteria, Building 11 between Buildings 30 and 8, is scheduled for completion in late August. The new cafeteria will be similar in many respects to the present Building 3 cafeteria, but will depend upon the older cafeteria's kitchen for most of the food preparation and cooking.

The Exchange Council in January appointed a committee to begin planning for an on-site employee recreational facility and to investigate the problems of developing such a facility. Committee recommendations on the facilities needed were based upon an employee survey conducted in February by the Employee Activities Association. MSC employees filled out questionnaires to indicate their preferences of types of recreational facilities and equipment. The survey received a 57 percent response in questionnaires returned.

Currently in progress is a Committee study of government policy and precedents involving on-site employee recreation facilities. Also, the Committee has initiated an architectural design competition with the Rice University and University of Houston schools of architecture for basic conceptual design of the facilities.

Financing of construction and operation of the recreational facilities would come from Exchange Council funds. From almost \$80,000 available January 1, 1966, estimated funding available at the end of 1966 would increase to \$140,000 and by the end of 1967, \$200,000 would be available.

Exchange Council Chairman Paul E. Purser emphasizes that until many details are ironed out, the Council cannot request NASA or MSC management approval of the plans for the recreational facilities.

Point Three of the Council's 1966 plans is the installation of sales counters in both cafeterias at which personal non-food items such as smokers supplies, color photographs of NASA-MSC facilities and activities, books, face tissues and NASA-insignia jewelry would be sold. The counter would not be installed until after completion of the second cafeteria so that the congestion in the present Building 3 cafeteria would not be aggravated.

The fourth point in the Exchange Council's plan is development of an information program on Council operations and objectives through *Roundup* articles and through other means.

The following Exchange Council profit-and-loss statements and statements of financial condition for calendar year 1965 have been audited and certified by the firm of Cornish and McElhinney, certified public accountants.

Cafeteria, Exchange Council Annual Reports

MSC CAFETERIA
STATEMENT OF FINANCIAL CONDITION
December 31, 1965

MSC CAFETERIA
STATEMENT OF EARNINGS AND FUND BALANCE
For The Year Ended December 31, 1965

ASSETS		
Cash in bank—regular account	\$15,784.74	
Cash in bank—payroll account	283.89	
Petty cash	90.81	
Cashiers change fund	1,400.00	
Accounts receivable	661.90	
Inventory—food	10,592.42	
Inventory—supplies	682.10	
TOTAL ASSETS		\$29,495.86
LIABILITIES		
Accounts payable—trade	\$17,922.48	
Accrued salaries—payable	644.17	
Payroll taxes payable	2,584.38	
Loan payable—NASA Exchange—MSC	3,247.12	
Total Liabilities		\$24,398.15
RESERVE AND FUND BALANCE		
Reserve:		
For asset replacement	11,555.00	
Fund Balance (Deficit):		
From operations	(6,457.29)	
Total Reserve and Fund Balance		5,097.71
TOTAL LIABILITIES, RESERVE AND FUND BALANCE		\$29,495.86

Income:			
Sale of food		\$394,264.58	
Sale of grease		533.50	
Total Income			\$394,798.08
Cost of Food Sold:			
Inventory—January 1, 1965	\$ 8,933.09		
Purchases	187,602.16		
Total Food Available for Sales		196,535.25	
Less: Inventory—December 31, 1965		10,592.42	
Cost of Food Sold			185,942.83
Gross Profit on Sales:			208,855.25
Expenses:			
Supplies:			
Inventory—January 1, 1965	578.69		
Purchases	5,500.08		
Total	6,078.77		
Less: Inventory—December 31, 1965	682.10		
Total Cost of Supplies		5,396.67	
Accounting	1,240.00		
Decorations	320.34		
Employee benefits	467.76		
Insurance	6,277.62		
Laundry	5,627.89		
Miscellaneous	160.55		
Office supplies	352.29		
Purchases of china, etc.	1,835.13		
Repairs	593.19		
Salaries	173,761.92		
Taxes—payroll	5,428.52		
Total Expenses			201,461.88
Net Income from Operations:			7,393.37
Deduct: Reserve for asset replacement			12,000.00
Net (Loss) for the Year:			(4,606.63)
Add: Fund Balance (Deficit) December 31, 1965			(1,850.66)
Fund Balance (Deficit) December 31, 1965			\$ (6,457.29)

NASA EXCHANGE—MSC STATEMENT OF EARNINGS AND FUND BALANCE For the Year Ended December 31, 1965		
Income:		
Sale of books	\$975.96	
Less: Cost of books sold	951.89	
Gross profit on sale of books	\$ 24.07	
Houston Coca-Cola Bottling Co	11,453.91	
Pepsi-Cola Bottling Co	8,846.41	
Sanitary Vending Machines	463.30	
Servamation Foods of Houston	35,918.30	
Southwestern Bell Telephone Co.	449.17	
Houston Post	24.73	
Interest income	1,609.54	
Wall Street Journal	80.04	
TOTAL INCOME		\$58,869.47
Expenses:		
Accounting	200.00	
Duck feed	146.65	
Employees Activity Association-Picnic	581.40	
Freight—vending machines	119.92	
Insurance	234.00	
Office supplies	6.35	
Supplies for resale	234.60	
Utilities—vending machines	1,460.91	
TOTAL EXPENSES		2,983.83
Net Income from Operations:		55,885.64
Deduct: Contributions to Employees Activity Association		12,000.00
Net Income for the Year:		43,885.64
Add: Fund Balance December 31, 1964		5,630.96
Fund Balance December 31, 1965		\$49,516.60

NASA EXCHANGE—MSC
STATEMENT OF FINANCIAL CONDITION
December 31, 1965

ASSETS		
Current Assets:		
Cash in bank—checking account	\$ 5,065.74	
Cash in banks—savings accounts	70,075.00	
Interest receivable	628.74	
Loan receivable—NASA #2 Operating Fund	500.00	
Loan receivable—MSC Cafeteria	3,247.12	
TOTAL ASSETS		\$79,516.60
RESERVE AND FUND BALANCE		
Reserve:		
For construction of NASA employees recreation center*	\$30,000.00	
Fund Balance:		
From operations	49,516.60	
TOTAL RESERVE AND FUND BALANCE		\$79,516.60

* Since December 31, 1965, the Council appropriated an additional \$30,000 to the reserve for the recreational facility bringing the total to \$60,000.

OUT OF TEXAS' PAST—

Lady Cannoneer Routs Rangers During Miniature Texas War

Evidently there's something about a female gunner that gets a Texan right here. The "Mother of Texas," glamorous Jane Long, is seldom pictured in historic graphics at the spinning-wheel, the cooking fire or the cradle. Instead, our artists station her on the rampart of a fort on Bolivar Peninsula, just across the Roads from Pelican Spit, standing behind a presumably loaded and charged six-inch gun with a rammer in one hand and a hot match in the other, ready to blast the marauding Karankawas into microns.

Curiously, at least one other Texas heroine is represented traditionally as a citizen artillery-woman applying fire to the touch-hole of a cannon. Like our brave Janey, Angelina Eberly was a widow with two children, who had to become an inkeeper to make ends meet.

There ends the parallel. Jane's famous hostelry, where heroes and frontier statesmen feasted and swung their partners, was at

then sophisticated Brazoria, just down the coast from Galvez Bay. Angelina's Eberly House, although it entertained many a politico, was no Hill Country Hilton, for it was located at then rough-and-ready Austin, the isolated capital of the Lone Star Republic.

Angelina fired her fieldpiece with effect in a disturbance of 1842 called the Archive War, a comic-opera incident that was typical of early Texas, where heroes, gentlemen, rascals and fools rubbed elbows at every crossroads tavern.

In March of 1842 a Mexican army division attacked San Antonio and occupied the city for two days before it was driven out by Texas regulars. President Houston, serving his second term, called an emergency session of Congress, and because Austin was so close to often-raided San Antonio he named Houston (the former capital) as the meeting place. At the same time he ordered Secretary of War George Hockley to have the national archives moved to Houston.

Austin citizens—to a woman—rebelled. Fearing that the president wanted to move the capital permanently back to the city that was named for him, they formed a vigilance committee, packed the archives and set a guard on them.

Congress, sitting in Houston, enacted a bill giving Houston dictatorial powers to raise money and wage war. Houston vetoed it—and was threatened with impeachment and even with assassination.

That fall Houston transferred the seat of government to Washington-on-the-Brazos, hoping to placate Austin. But because the San Antonio-Austin area was still in danger (one Mexican task force had captured San Antonio and kidnapped the entire personnel of a district court), Houston sent a company of Texas Rangers under Capt. Tom Smith and Eli Chandler to Austin to fetch the archives to Washington.

Finding the archives unguarded, the Rangers began loading them into wagons. But they were discovered by Angelina Eberly, who knew that a six-pounder on Congress Avenue was kept loaded with grape against an Indian attack. Without hesitation this angelic creature womaned the cannon, swung it toward the Rangers' wagons and, quickly calculating elevation and windage, banged

away. Several rounds of grape-shot tore through a wall of the Land Office, injuring no one, but arousing the indignant citizens of Austin and putting the already celebrated Rangers to flight.

The Rangers retreated with that part of the archives that they had loaded into their wagons. But they were pursued by the Austin vigilance committee, led by Capt. Mark Lewis. And on New Year's Day 1843 the VC overtook the Rangers in Williamson County (where Prof. Robert S. Hyer reportedly developed a wireless communications system before Marconi—as reported here a fortnight ago.)

A few shots were fired, and the Rangers surrendered the archives. In justice to the reputation of that famous band of lawmen, it should be noted that Houston had ordered them to avoid bloodshed.

Anyway, the Austin vigilantes hauled the archives back to Capitol Hill, where they remained for good. The capital was restored to Austin in 1844, and the national archives are still on the Hill—in the State Archives Building.

—Sigman Byrd

Dr. Piccard Gets Lovelace Award

Dr. Jeannette Piccard, MSC consultant and pioneer in high-altitude balloon research, next month will receive the American Astronautical Society's W. Randolph Lovelace II Award. She was named to receive the award because of her past exploits and continuing efforts in the field of spaceflight.

Dr. Piccard and her husband, Jean Piccard, ascended to 57,579 feet in an upper-atmosphere research balloon in 1934.

The Lovelace Award is made in memory of Dr. W. Randolph Lovelace II, NASA-OMSF Director of Medicine and founder of the Lovelace Foundation, Albuquerque, N.M., who was killed last December 12 in a Colorado aircraft crash.

The AAS Honors Night Dinner will be held May 24 during the Society's twelfth annual meeting May 23-25. Six other MSC people—Richard S. Johnston, Dr. Charles A. Berry, Walter M. Schirra, Thomas P. Stafford, Frank Borman and Jim Lovell—will also receive AAS awards. (See April 15 Roundup, page 3.)

Which Library?

The correct mail routing symbol for the MSC Technical Library is BM6. Material being returned to the Technical Library should not be sent to Public Affairs Office Historical and Library Services, AP6.

On The Lighter Side



In engineering, Smith, we say 'maximum stress' ... not 'plumb tuckered.' (Filched from General Dynamics News)

Space News Of Five Years Ago

April 29, 1961—Saturn booster firing using timer at predetermined setting was successful in flight qualification test.

May 1, 1961—NASA Administrator Webb issued a statement concerning the two-year Mercury manned space flight program, which said, in part: "NASA had not attempted to encourage press coverage of the first Mercury-Redstone flight. It has responded to press and television requests, with the result that over 100 representatives of the press, radio and TV are now at Cape Canaveral... We must keep the perspective that each flight is but one of the many milestones we must pass. Some will completely succeed in every respect, some partially, and some will fail. From all of them will come mastery of the vast new space environment on which so much of our future depends."

May 2, 1961—Manned Mercury-Redstone 3 launch postponed because of rain squalls in the recovery area.

May 4, 1961—House Science and Astronautics Committee approved \$126.6 million additional to the President's space budget, marking most of the increase for the Apollo program.

First part of MR-3 firing countdown began at T-640 minutes (6:30 am CST) and held at T-390 minutes until final countdown began at 10:30 pm CST.

May 5, 1961—MR-3 designated the Freedom 7, the first Mercury manned suborbital flight, was launched from Cape Canaveral, with Astronaut Alan Shepard as the pilot. The Redstone booster performed well during the boosted phase, although there were some vibrations, and cutoff was well within specified limits. After separation, Shepard exercised manual control of the spacecraft in the fly-by-wire and manual proportional modes. The attitude control system operated well, with few thruster fuel leaks. Reentry and landing were accomplished without any difficulty. During the flight, the spacecraft attained a maximum speed of 5,180 miles per hour, rose to an altitude of 116½ statute miles, and landed 302 statute miles downrange from Cape Canaveral. The pilot

experienced a maximum of 6 g's during the booster acceleration phase and slightly less than 12 g's upon reentry. The duration of the flight was 15 minutes and 22 seconds, with weightlessness existing for approximately five minutes. Recovery operations were perfect, as helicopters were able visually to follow the descent of the spacecraft. Contact was made with the pilot two minutes after impact and recovery was initiated. There was no damage to the spacecraft, and Shepard was in excellent condition. The first Mercury suborbital flight was a success.

Saturn static firing of 44.17 seconds duration to test fire detection system at engine position No. 2 was successful, the second SA-1 flight qualification test at Marshall Space Flight Center.

May 8, 1961—Alan B. Shepard, Jr., Mercury astronaut, was awarded NASA's Distinguished Service Medal by President Kennedy at a special White House ceremony. It was followed by an informal parade to the Capitol by the seven astronauts for lunch, and a press conference at the State Department auditorium.

May 9, 1961—Sen. Robert S. Kerr, chairman of the Senate Aeronautical and Space Sciences Committee, told a group at the National Radio and Television Convention that President Kennedy accepted the views of NASA and congressional leaders in approving the manned Mercury-Redstone flight of May 5.

May 11, 1961—USSR's *Izvestia* headlined the result of Soviet radar probes of planet Venus, a report which said that the Venusian day was from nine to 11 Earth days, and that the astronomical unit (mean distance from the Earth to the Sun) was computed at 149,457,000 kilometers (92,812,797 miles). These figures were at variance with detailed study by scientists at JPL and MIT.

Static test of 111 seconds' duration of Saturn booster was successful, the final SA-1 flight qualification test of the S-1 stage.

Mercury Spacecraft 8A was delivered to Cape Canaveral for the Mercury-Atlas 4 orbital unmanned (mechanical astronaut) mission.

The SPACE NEWS ROUNDUP, an official publication of the Manned Spacecraft Center, National Aeronautics and Space Administration, Houston, Texas, is published for MSC personnel by the Public Affairs Office.

Director Dr. Robert R. Gilruth
Public Affairs Officer Paul Haney
Editor Terry White
Staff Photographer A. "Pat" Patnesky



SPACE-CRAFTERS

FREE ENTERPRISE IN ACTION—Three members of the Space-Crafters, Inc. Junior Achievement company are shown by their display at the Junior Achievement Trade Fair in Houston Coliseum. The company produces desk sets with either small-scale Gemini spacecraft or with miniature astronauts. Left to right are Kathy Vanderlip, vice president-sales, Butch Dodson and Charlie Villareal.

Junior Achievement Teaches Youth How Free Enterprise Operates

MSC's "biggest little industry" has for sale an item that just might fill the bill for a graduation gift or as a gift to go on someone's desk. It is a walnut-mounted desk set accented with a scale-model Gemini spacecraft or optionally with a miniature astronaut suited up for a lunar excursion.

The desks sets are the product of Space-Crafters, Inc., a Junior Achievement Company sponsored and advised by MSC employees, and sell for \$3 each. Space-Crafters is one of several Junior Achievement companies which have been operating in the Clear Lake area during the past year.

Junior Achievement companies are made up of high school students who learn first-

hand through operating a business how the free-enterprise system works. Some of the companies fail; others meet with moderate success, and still others make the big-time with large sales records and pay substantial dividends to stockholders when the companies are liquidated at the end of the school year.

Space-Crafters, Inc. falls into the successful category, for through production, sales and administrative leadership and a certain amount of perseverance the teen-age industrialists have built a going concern. Moreover, they selected a product with a ready market. But, as happens to all JA companies at school-year end, they are closing shop.

The Space-Crafters sales force this month will make door-to-door calls in Nassau Bay and other MSC-area communities to clear their inventory of desk sets in a sort of going-out-of-business sale. Orders for desk sets may be made by calling Dennis Stout at 591-3787. The production line has stopped and stocks of sets are getting low. Desk sets are also for sale at the Brass Shop in Mirimar Plaza.

Members of the firm of Space-Crafters, Inc. are Mike Ettridge, Sandra Gammon, Hugh H. Saum III, Jennifer Harris, Paul Anderson, Vivian Boswell, Larry Campagna, Cathy Chance, David Walraven, Charlie Villareal, Kathy Vanderlip, Dennis Stout, Linda Hinners, George Graham, Dan Fraley, Butch Dodson and Mike Self.

MSC employees who have served as advisors to Space-Crafters during the past year are Jack Kinzler, Dave McGraw and Gene Horton. The company meets each Tuesday from 7 to 9 pm at the Clear Creek High School League City.

Roundup Swap-Shop

(Deadline for classified ads is the Friday preceding Roundup publication date. Ads received after the deadline will be run in the next following issue. Send ads in writing to Roundup Editor, AP3. Ads will not be repeated unless requested. Use name and home telephone number.)

FOR SALE

90-watt Johnson Pacemaker xmr \$165. National NC-300 rev. \$185. Gotham vertical antenna \$5. All for \$295. Don Witt, SU 2-0648.

32-foot Chris-Craft cruiser. Sleeps 6, new upholstery, rebuilt engines and hull. Stall 36 Lakeside Boat Storage, NASA Road 1. Asking \$4,000. Henry Francher, 877-1379.

115-volt 1-hp Amana air conditioner w/window kit, draws 7.5 amps. \$60. TV dishwasher, holds 10-plate setting. Portable or built-in. \$95. Wally Graves, HU 5-2933.

Hallcrafters S-38 communications rev. Sell or trade for FM tuner in operating condition. M. W. Lippitt, Jr., MI 9-3200.

38-foot 2-bd room Fleetwood mobile home. Edith Linson, HU 2-7793.

Baby layette. Starkline crib and mattress w/bumper pad, bassinet w/unused mattress, large baby chest, scales, infant seat. All good condition. \$45. Barbara Vickers, MI 9-4865.

21 in RCA table-model TV, good working condition, \$30. Earl Rubenstein, 877-3288.

220-volt 14,000 BTU Sears Goldspot windows air conditioner, used one season. Thelma McGee, HU 8-3188 after 5 pm.

9x12-foot Azrikan carpet, champagne color, w/rubber pad, like new used 4 months. \$50. 20-in 2 speed Sears window fan, used 2 months. \$10. Leonard Swank, HA 4-2280.

1964 Kit Olympia 10x55 mobile home, 2-bedroom, air conditioner, nylon carpet, washer, \$4000. John Whistler, HU 5-2287.

3-bedroom 2-bath, electric kitchen, central heat/air, carpeted, covered patio, child playhouse, landscaped. Meadowcreek Village, \$21,900. George Mehailescu, HU 6-5305.

4-bedroom home on 1/2-acre wooded creekfront lot, Friendswood. Edith Linson, HU 2-7850, HU 2-7793.

3-bedroom, 2-bath brick house, air conditioned, fenced, landscaped, in Swan Lagoon. \$22,500 or equity plus assume \$142/month payments. Dr. Howard Minners, 932-2417.

1958 Cadillac, xcmt condition, new trsm, brakes, air conditioned, \$595. George Bliss, 534-3228.

1958 Chevy 1/2-ton pickup, 6-cyl, \$325. 1964 Evinrude "Sport 16" boat, 90-hp inbd/otbd power-tilt, 2-22-gal tanks, Yarbrough gelv trailer, \$2193. Wally Graves, HU 5-2933.

1961 Pontiac Catalina, hydromatic, power steering, low mileage, many extras, clean. Owners: L. R. Sultan, 932-2791.

1955 Dodge Royal 4-door V-8, stickshift, heater and radio, 1 owner. Vera Vick, HU 3-3876.

1959 Pontiac, good condition, \$350. George Mehailescu, HU 6-5305.

1962 Pontiac Grand Prix, fully equipped, \$1250. Edith Linson, HU 2-7793.

1959 Hillman Minx deluxe station wagon, 81,500 miles, runs well, new valve job, \$150. 1963 Falcon deluxe station wagon, air conditioned, tinted glass, padded dash and visors, seatbelts, whitewalls, 35,500 miles. Book value \$1175. Sell for \$1100.

Young bachelor seeks roommate(s) to share apartment at Portofino or Tally-Ho. Larry Kuznetz, 932-4104.

RIDER POOLS

One or two additional rider/drivers wanted to join existing car pool in Meyerland-Westbury area. 8:30-5 shift (8-4:30 if willing to remain until 5). Stephen Jacobs, RI 7-7923.

Ride wanted from Dickinson to Bldg 2, 8:30-5 shift. Patsy Witt, 534-3826.

Space News ROUNDUP!

MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

EMPLOYEE NEWS

MSC BOWLING ROUNDUP

MIMOSA MEN'S LEAGUE TEAM	WON	LOST
Chizzlers	31	5
Foul Five	22	14
Alley Oops	20	16
Technics	19	17
Whirlwinds	19	17
Road Runners	18	18
Fabricators	15	21
Goobers	14	22
Agitators	13	23
Green Giants	9	27

High Game: B. Graham 273, J. Keggins 267.

High Series: G. Amason 701, B. Harris 701.

High Team Game: Whirlwinds 1108, Alley Oops 1105.

High Team Series: Chizzlers 3138, Whirlwinds 3108.

Windjammers Plan Bay Rendezvous

The MSC Sailing Club May 8 will hold a "sail-in" at a spoil-bank island in Galveston Bay. The island is just south of Five-Mile Pass and east of Houston Ship Channel marker No. 75.

Center-boarders can be beached on the island, but skippers of long-legged keel boats will have to anchor offshore. An Ensign sloop with a dark-blue hull and flying an orange pennant from the masthead will mark the rendezvous point. Meeting time is 1 pm.

A planning meeting for those intending to take part in the outing will be held Wednesday, May 4 at 5:15 pm in Bldg. 13, Room 108. Call Jerry Grayson at 3286 or Jay Legendre at 3566 for further details.

AFGE Rep Consults With MSC Employees

The American Federation of Government Employees will meet individually with interested employees during the week of May 9, to discuss membership in the AFGE. Mr. Glenn Pettersson, National Representative of the Tenth District, AFGE, will be available at both the Clear Lake site and Ellington Air Force Base to discuss membership with interested employees. His schedule will be as follows:

May 9—Bldg. 2, Room 850.
7:45 to 8:30 a.m.
During Lunch Period After 5:00 p.m.

May 10—Bldg. 4, Room 378.
6:45 to 7:30 a.m.
After 4:00 p.m.
Bldg. 8, Room 272.
During Lunch Period

May 11—Bldg. 12, Room 262-A.
7:15 to 8:00 a.m.

During Lunch Period After 4:30 p.m.
May 12—Bldg. 323, Room 8 (EAFB).

7:15 to 8:00 a.m.
During Lunch Period After 4:30 p.m.

May 13—Bldg. 13, Room 103-A.
7:45 to 8:30 a.m.
During Lunch Period After 5:00 p.m.

All employees have the right to participate or refrain from participating in these meetings. In order for an employee to attend one of these meetings during his regular working hours, he must obtain prior approval of annual leave. Employees have the right, freely and without fear of penalty or reprisal, to join any lawful employee organization or to refrain from any such activity.

Aero Club Brass



NEW OFFICERS—Newly-elected MSC Aero Club officers, left to right front row are James Donnell, vice president, Don Bray, president, and Lou Bernardi, secretary-treasurer. Back row: Mel Feldman, information officer, and Sal Tripoli, training officer. An Aero Club membership survey placed a Cessna 150 as first choice, Cessna 172, second, and Beechcraft Musketeer, third choice. Club ground school begins May 17. The next meeting will be May 10 at 5 pm in the News Center auditorium.

Singletons' Dance Scheduled May 7

The MSC Singleton Club May 7 will hold a semi-formal dance at the Villa Monterrey, 9150 Gulf Freeway. The dance will run from 8:30 pm to 1 am in the Third Club Section.

Music will be by the Sultans band. Ticket information can be had from Suzanne Thoben at 4904, and tickets may also be bought at the door.

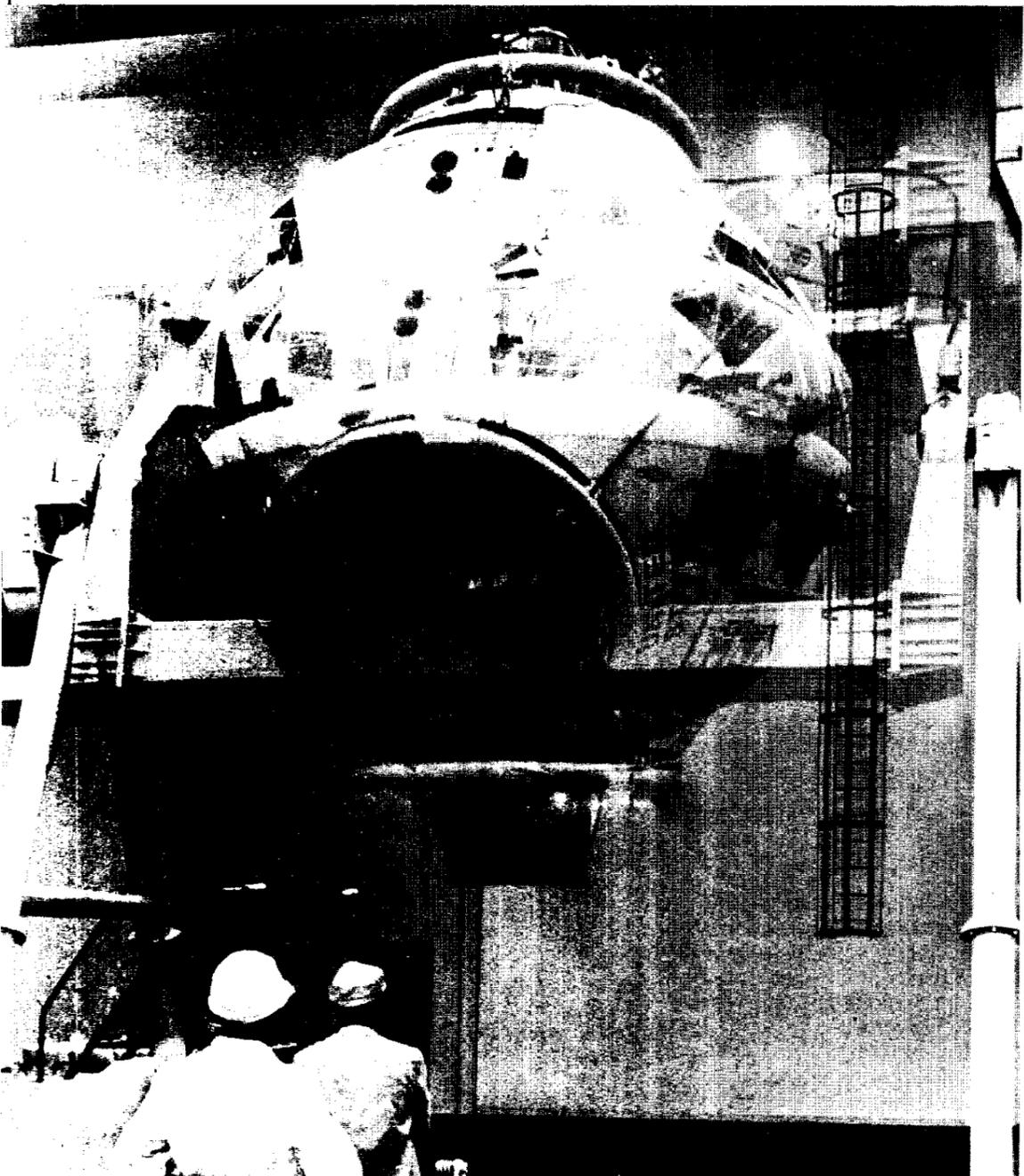
The Singletons will hold an election meeting May 17 at the Ellington AFB officers' club Blue Room to which all members and interested persons are urged to attend.

Getting Acquainted With Saturn IB



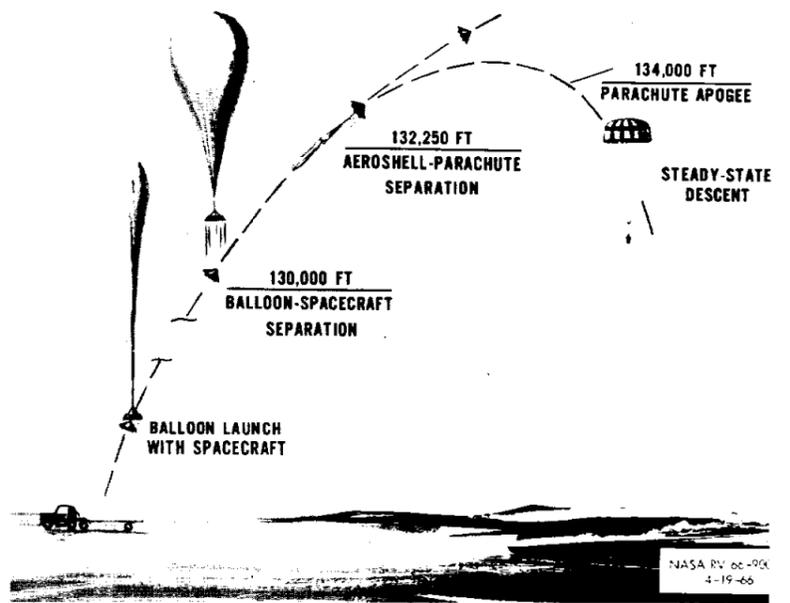
AND WE RIDE HERE—Prime crew for the first manned Apollo mission took part in a three-day study of the Saturn IB launch vehicle at Marshall Space Flight Center. Left to right are Edward White, Lee B. James, MSFC Saturn IB vehicle manager, Virgil I. Grissom and Roger Chaffee. Other attending the MSFC briefings were James McDivitt, Russell Schweikart, David Scott, Walter Schirra, Frank Borman, Walter Cunningham, Donn Eisele and Donald K. Slayton.

In a Tumbling Mode



CLEAN SWEEP, FORE AND AFT—Apollo command module 011 is tumbled by a special fixture in a large clean room at North American's S&ISD plant in Downey, Calif., as a final inspection and cleaning procedure prior to shipment to Kennedy Space Center. The spacecraft's interior is vacuumed out in each of several positions to remove metal chips, dust and other manufacturing debris. Spacecraft 011 will be mated to the Saturn IB booster for the Apollo/Saturn 202 mission later this year.

PLANETARY PARACHUTE FLIGHT TEST PROGRAM



PLANETARY PARACHUTE—Sketch shows typical flight profile of developmental thin-atmosphere parachutes which the NASA Office of Advanced Research and Technology will begin testing this year at White Sands Missile Range, N.M.

Work Starts This Year On Planetary Parachute

Promising designs and techniques for using parachutes to land instrumented unmanned capsules on Mars will be explored in a broad NASA research program.

Starting this summer, balloons and sounding rockets will carry experimental parachute-equipped payloads to high altitudes where the thin Earth atmosphere compares with that of Mars. Then the test units of varying shapes and sizes will be accelerated to determine how well different parachutes can be deployed behind them. Parachutes of different designs and materials will be tested.

The flight units from which the parachutes are to be deployed will be based on concepts that hold promise of providing significant braking (aerodynamic deceleration) in a thin planetary atmosphere.

Those with full-scale parachutes will simulate the geometry and mass of a current concept of a Mars entry capsule.

The shallow, conical blunt-nosed unit will be 15 feet in diameter.

This Planetary Entry Parachute Program is conducted as part of the broader Planetary Entry Decelerator Program of NASA's Office of Advanced Research and Technology to give basic support to the Voyager planetary exploration program of NASA's Office of Space Science and Applications.

The parachute project will be managed by NASA's Langley Research Center, Hampton, Va. All aspects of the program are closely coordinated with NASA's Jet Propulsion Laboratory, Pasadena, Calif., manager of the Voyager project.

Information obtained from the Mariner IV mission in 1965 is being used in the entry parachute program.

In planning the parachute experiments, officials are using the range of four to 10 millibars as a base. In the Earth's atmosphere, this level is approached at an altitude of about 130,000 feet. (Earth sea level pressure is about 1,000 millibars.)

Balloon-borne experiments with the 15-foot entry body will be carried to about 130,000 feet to simulate velocity and dynamic pressure. The unit will be released with its flight axis pointed slightly upward, then 12 small rocket motors will accelerate it to Mach 1.2 (800 mph) in level flight.

This velocity closely simulates the maximum anticipated at the time of parachute deployment for a capsule entering the Martian atmosphere.

At these conditions the test parachute will be deployed and the parachute and an instrument package will separate from the 15-foot shell. The parachute and instrument package will be recovered for data analysis and evaluation.

The rocket-launched units will carry test payloads to 130,000 feet and Mach 1.2 for parachute deployment. They will be smaller than the balloon units and shaped for lower drag capability.

Both the balloon and rocket tests will be conducted at the White Sands Missile Range in New Mexico. Six balloon-borne flights and ten rocket-launched flights are planned.

Martin Appointed Radiological Officer

Shell E. Martin has been designated Radiological Control Officer reporting to Dr. D. Owen Coons, Chief Center Medical Office. Martin's function will be to direct compliance by MSC with AEC regulations regarding use of radiation sources.